REMARKS

Claims 1-17 are pending in the present application. Applicants have carefully studied the outstanding Official Action. The present remarks are intended to be fully responsive to all points of rejection. Favorable reconsideration and allowance of the present application are hereby respectfully requested.

Applicants have amended some paragraphs of the specification. No new matter has been added.

The following paragraphs of the specification have been amended:

the paragraph beginning at line 24 on page 7 of the specification has been amended to reflect issuance of U.S. patent application Ser. No. 09/126,378 as US Patent No. 6,404,522 and to correct minor editorial matters; and

the paragraph bridging pages 7 and 8 of the specification has been amended to reflect issuance of U.S. patent application Ser. No. 09/389,345 as U.S. Patent No. 6,574,018 and to correct minor editorial matters.

Claims 1-17 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 6,288,808 to Lee et al. ("Lee") in view of an article titled "Code-Division Multiple Access: Novel Multiplexing Strategy in Optical Fiber Networks" of Meghavoryan et al. ("Meghavoryan").

Lee describes an optical asynchronous transfer mode ATM switch for recovering the limitation of processing capacity and performing large capacity switching.

Meghavoryan describes performance of an analytical review of different fiber-optic code division multiplexing (OCDMA) systems.

Claim 1 refers to switching to a destination route upstream optical signal samples that are obtained from a first source by a spread spectrum technique and upstream optical signal samples that are obtained from additional NCC sources, and recites, *inter alia*, a combination comprising optically converting the upstream optical signal samples that are obtained from the first source and the upstream optical signal samples that are obtained from the additional NCC sources into a broadband combined series of upstream optical signal samples at a combined data rate DR_C, and routing the broadband combined series of upstream optical signal samples to the destination route.

In rejecting claim 1, the Examiner takes the position (last four lines on page 3 and first two lines on page 4 in the outstanding Official Action) that it would have been obvious to one of ordinary skill in the art at the time of the invention that the OCDMA teaching of Meghavoryan could be applied to each of several of the multi-wavelength signals

from different sources in the system of Lee, to provide the benefit of cost effective high transmission bandwidth for signals that have both wavelength division multiplexing and time division multiplexing, as taught by Meghavoryan.

Applicants respectfully submit that the combination of Lee and Meghavoryan as suggested by the Examiner is improper. Specifically, although Meghavoryan is concerned with OCDMA coding, and shows OCDMA coders and decoders and an OCDMA system having a transmitter side and a receiver side, spread spectrum signals in Meghavoryan exist only in intermediate stages. The inputs to the OCDMA coders, the outputs from the OCDMA decoders, the inputs to the OCDMA system, and the outputs from the OCDMA system are all non-spread spectrum signals. Meghavoryan therefore does not output spread spectrum signals, and certainly not WDM spread spectrum signals.

Since in the combination of Lee and Meghavoryan neither spread spectrum signals nor WDM spread spectrum signals are outputted from Meghavoryan, the system of Lee cannot receive and process spread spectrum signals or WDM spread spectrum signals and thus at least the following limitations of claim 1 are not taught or suggested by the combination of Lee and Meghavoryan:

(1) Upstream optical signal samples that are obtained from a first source by a spread spectrum technique;

(2) Optical conversion into a broadband combined series of upstream optical signal samples at a combined data rate DR_c; and

(3) Routing of the broadband combined series of upstream optical signal samples.

If Meghavoryan would have been modified to output to Lee spread spectrum signals from within an intermediate stage, that is, from the output side of an OCDMA coder, then such a modification would change the principle of operation of Meghavoryan and would render Meghavoryan unsatisfactory for its intended purpose because the outputted spread spectrum signals will be fed to the system of Lee and will not reach an OCDMA decoder as originally intended in Meghavoryan.

Additionally, even if, for the sake of argument only, spread spectrum signals outputted from an OCDMA coder of Meghavoryan to the system of Lee would have been processed in the system of Lee, and then returned to Meghavoryan and fed to an OCDMA decoder, then it is pointed out that throughout the various multiplexing/demultiplexing stages and the various TDM-to-WDM and WDM-to-TDM conversions in Lee such spread spectrum signals would have been mixed and destroyed. Therefore, the OCDMA decoder of Meghavoryan would have not

been able to properly decode the spread spectrum signals thus, again, rendering Meghavoryan unsatisfactory for its intended purpose.

Furthermore, if Lee would have been modified to receive spread spectrum signals from within an intermediate stage in Meghavoryan, that is, from the output side of an OCDMA coder in Meghavoryan, then such a modification would change the principle of operation of Lee, and would render Lee unsatisfactory for its intended purpose because the spread spectrum signals would interfere with the TDM and WDM signals and cause the WDM-to-TDM Conversion Modules and the TDM to WDM Hybrid Switching Modules of Lee to operate improperly.

Since the above modifications change the principles of operation of Meghavoryan and Lee and render Meghavoryan and Lee unsatisfactory for their intended purposes, the combined teachings of Lee and Meghavoryan are not sufficient to render claim 1 prima facie obvious, and also there can be no suggestion and no motivation to make the modifications.

Additionally, Applicants respectfully submit that such modifications are contrary to accepted wisdom in the art because they result in a significant disadvantage of signal broadening due to the OCDMA coding with no apparent reason and no alternative advantage. Such a proceeding which is contrary to accepted wisdom in the art is evidence of nonobviousness of

claim 1 and of the improper rationale for combining Lee and Meghavoryan.

Furthermore, Applicants respectfully point out that there is no suggestion to combine Lee and Meghavoryan. Lee does not suggest such a combination, and Meghavoryan specifically indicates, in lines 3-4 in section 1 on page 299, that the CDMA schemes have been proposed as an alternative to TDM and WDM. Meghavoryan, therefore, does not suggest any combination of CDMA with other techniques, but rather use of CDMA as an alternative to the other techniques.

Additionally, it is respectfully submitted that the Examiner did not particularly show how the OCDMA teaching of Meghavoryan could be applied to each of several of the multi-wavelength signals from different sources in the system of Lee, and did not suggest any way of combining or modifying the Lee and Meghavoryan references.

Applicants also respectfully submit that neither Lee nor Meghavoryan suggest the desirability of the claimed features of claim 1.

Combining Lee and Meghavoryan is therefore inappropriate for rejecting claim 1.

Thus, Applicants respectfully point out that the Examiner has failed to establish a prima facie case for the unpatentability of claim 1.

Claim 1 is therefore deemed allowable.

Claim 2 depends from claim 1 and recites additional patentable subject matter. Also as regards claim 2, Applicants respectfully submit that Lee and Meghavoryan do not show or suggest at least the features of claim 2 which relate to dropping the upstream optical signal samples obtained from the first source, and to converting the dropped upstream optical signal samples obtained from the first source into a first series of upstream optical signal samples centered around a channel wavelength lD. Meghavoryan only mentions add-drop (ADM) multiplexers in general in the last two lines in the first paragraph of section 1 on page 299 and in the last paragraph on page 302. Claim 2 is therefore believed to be allowable.

Claim 3 depends indirectly from claim 1 and recites additional patentable subject matter. Claim 3 is therefore believed to be allowable. Claim 4 depends from claim 1 and recites additional patentable subject matter. Also as regards claim 4, Applicants respectfully submit that Lee and Meghavoryan do not show or suggest at least the features of claim 4 which relate to dropping the upstream optical signal samples obtained from the first source, and to converting the dropped upstream optical signal samples obtained from the first source into a first broadband series of upstream optical

signal samples. As mentioned above with reference to claim 2, Meghavoryan only mentions add-drop (ADM) multiplexers in general in the last two lines in the first paragraph of section 1 on page 299 and in the last paragraph on page 302. Claim 4 is therefore believed to be allowable.

Claim 5 depends from claim 1 and recites additional patentable subject matter. Claim 5 is therefore believed to be allowable.

Claim 6 refers to switching to nn routes a broadband series of downstream optical signal samples obtained by utilizing a spread spectrum technique, and recites, *inter alia*, a combination comprising optically converting the broadband series of downstream optical signal samples into nn series of downstream optical signal samples, and routing the nn series of downstream optical signal samples to the nn routes respectively.

In rejecting claim 6, the Examiner takes the position (last three lines in the paragraph bridging pages 6 and 7 in the outstanding Official Action) that it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the OCDMA teaching of Meghavoryan with Lee as described for claims 1 and 9.

Applicants respectfully point out that the arguments submitted above with respect to the patentability of claim 1 also apply to claim 6.

Additionally, Applicants respectfully submit that both Lee and Meghavoryan lack elements and functionality which are essential for operation in an opposing direction and the existing elements of Lee and Meghavoryan do not provide the necessary functionality for operation in an opposing direction.

Meghavoryan only shows one-way coders and decoders and a one-way system, and lacks the functionality and elements which enable operation in an opposing direction. Meghavoryan also does not teach operation in an opposing direction.

With respect to Lee, Lee enables switching and transmission in a direction from Router I towards Router II but Lee lacks the functionality and elements which enable provision of wavelength separation in a direction from Router II towards Router I, which wavelength separation would have been necessary if communication in a direction from Router II towards Router I would have been contemplated. If, for the sake of argument only, communication in a direction from Router II towards Router I would have been contemplated in the system of Lee, then a multi-wavelength signal arriving from Router II in Fig. 7 of Lee would have to be separated into

single-wavelength signals that would have to be fed to the branching delay lines 54. However, the coupler 55 in Lee is an nx1 coupler (Lee, col. 6, lines 14-17) and as such the coupler 55 does not provide wavelength separation in operation in a direction from Router II towards Router I, but rather distributes the multi-wavelength signal arriving from Router II among all the branching delay lines 54. In order to obtain single-wavelength signals on the branching delay lines 54 as necessary for in the AWG 46, the system of Lee would have to use an appropriate filter on each of the branching delay lines 54. However, such filters are not at all shown or suggested in Lee, and Lee does not teach such filters and does not teach operation in an opposing direction, that is, a direction from Router II towards Router I.

The architecture of Lee is therefore a one-way architecture suitable for operation in a direction from Router I towards Router II but inoperable in an opposing direction, that is, a direction from Router II towards Router I.

Since neither Lee nor Meghavoryan teach operation in an opposing direction, the combined teachings of Lee and Meghavoryan necessarily cannot teach operation in an opposing direction.

Additionally, since the combination of Lee and Meghavoryan cannot provide a broadband series of optical

signal samples obtained by utilizing a spread spectrum technique (upstream or downstream) as discussed above with reference to claim 1 and Lee cannot provide wavelength separation in an opposing direction, at least the following limitations of claim 6 are not taught or suggested by the combination of Lee and Meghavoryan:

(1) Switching to nn routes;

(2) A broadband series of downstream optical signal samples obtained by utilizing a spread spectrum technique;

(3) Optically converting the broadband series of downstream optical signal samples into nn series of downstream optical signal samples; and

(4) Routing the nn series of downstream optical signal samples to the nn routes respectively.

Further additionally, since each of Lee and Meghavoryan is inoperable in communication in an opposing direction, then there can be no suggestion and no motivation to combine Lee and Meghavoryan and a person skilled in the art is not expected to combine Lee and Meghavoryan.

Combining Lee and Meghavoryan is therefore inappropriate for rejecting claim 6.

Thus, Applicants respectfully point out that the Examiner has failed to establish a prima facie case for the

unpatentability of claim 6. Claim 6 is therefore believed to be allowable.

Claims 7 and 8 depend from claim 6 and recite additional patentable subject matter. Claims 7 and 8 are therefore believed to be allowable.

Claim 9 is an apparatus claim corresponding to claim 1. The arguments submitted above with respect to the patentability of claim 1 also apply to claim 9. Claim 9 is therefore believed to be allowable.

Claims 10 and 11 depend from claim 9 and recite additional patentable subject matter. Claims 10 and 11 are therefore believed to be allowable.

Claim 12 is an apparatus claim corresponding to claim 6. The arguments submitted above with respect to the patentability of claim 6 also apply to claim 12. Claim 12 is therefore believed to be allowable.

Claims 13 and 14 depend from claim 12 and recite additional patentable subject matter. Claims 13 and 14 are therefore believed to be allowable.

The arguments submitted above with respect to the patentability of claim 1 also apply to claim 15. Claim 15 is therefore believed to be allowable.

Claim 16 depends from claim 9 and recites additional patentable subject matter. Claim 16 is therefore believed to be allowable.

Claim 17 depends from claim 12 and recites additional patentable subject matter. Claim 17 is therefore believed to be allowable.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is now in condition for allowance. Favorable reconsideration and allowance of the present application are respectfully requested.

If the Examiner has any questions he is invited to contact the undersigned at 202-628-5197.

Respectfully submitted,

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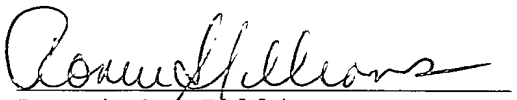
By 
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